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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ALLEN, MARIANNE P

ART UNIT PAPER NUMBER

1631

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,054

Applicant(s)

CHEIKH ET AL.

Examiner

Marianne P. Allen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 12-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 12-14, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 15-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Applicant's arguments filed 7/18/05 have been fully considered but they are not persuasive.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Information Disclosure Statement

The IDS submitted 10/15/01 and considered 12/14/02 inadvertently did not include the examiner's initials indicating consideration of U.S. Patent No. 5,770,718 (Moffatt). Enclosed is a copy of the page with the reference considered and initialed by the present examiner.

Claim Rejections - 35 USC § 112

SEQ ID NO: 5 is a 440 nucleotide sequence isolated from Zea mays or maize. At least 40 nucleotide positions are undefined (n). Table A on page 208 of the specification identifies SEQ ID NO: 5 as a maize adenine phosphoribosyl transferase. It was isolated from the LIB3061 cDNA library. Page 169 of the specification also identifies this library as CMz035. The library was generated from maize endosperm tissue at the V10+ plant development stage. SEQ ID NO: 5 is disclosed as having sequence similarity to NCBI GI 726304. GI 726304 corresponds to Accession No. U22442. This sequence is from Triticum aestivum (bread wheat). The length of this sequence is 845 nucleotides and the coding region is identified as being from nucleotides 48-593. The sequence encodes an adenine phosphoribosyltransferase. Alignment of SEQ ID NO: 5 with this sequence shows a query match of 28% and best local similarity of 66%. See alignment.

The specification does not appear to identify SEQ ID NO: 5 as a soybean (glycine max) sequence. NCBI Accession No. AI522952 was available after the effective filing date of the

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instant application. However, it provides the sequence for an adenine phosphoribosyltransferase from soybean. Alignment of SEQ ID NO: 5 with this sequence shows that the soybean sequence does not contain SEQ ID NO: 5. See alignment. Note that the soybean nucleic acid sequence does not have at least 20 contiguous nucleotides in common with SEQ ID NO: 5 and thus would not hybridize to SEQ ID NO: 5 under the conditions identified in the specification (see also below).

Xing et al. (Plant Science, 169:37-45, 2005) is not prior art but discloses sequences of adenine phosphoribosyl transferases from a variety of plants. Maize is not included. However, Accession No. U22442 sequence from wheat, Accession No. AI522952 from soybean, and Accession No. X58640 from *Arabidopsis thaliana* (see U.S. Patent No. 5,770,718 to Moffatt, of record) are discussed. Sequence comparisons and phylogenic analysis was performed. The conserved amino acid residues among six sequences from four different plants, including wheat and *Arabidopsis*, are set forth. (See abstract, pages 38 and 44 and Figures 2 and 3. These are more easily viewed on-line.)

When SEQ ID NO: 5 is translated beginning at nucleotide 103 and aligned with the wheat amino acid sequence, the encoded maize amino acid sequence with the best alignment is set forth on the following page. Note that the wheat sequence is not bolded (top sequence) and the sequence encoded by SEQ ID NO: 5 is bolded (bottom sequence). Note that the * indicates the presence in SEQ ID NO: 5 of an additional nucleotide that would result in a frame shift. This nucleotide has been considered a cloning error for purposes of producing the best amino acid alignment. Note that the \$ indicates the presence in SEQ ID: 5 of an additional codon "gct" for Ala. Note that "Xaa" indicates at least one unknown nucleotide in this triplet codon from SEQ

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ID NO: 5 such that multiple amino acids could be encoded. Note that + indicates highly conserved residues in the plant adenine phosphoribosyl transferases aligned by Xing et al.

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Met Ala Ser Asp Gly Arg Val Glu Arg Ile Ala Ser Ser Ile Arg Ala Ile Pro Asn

+ + + + +

Met Ala Ser\$Asp Ala Arg Leu Ala Xaa Ile Xaa Ser Xaa Ile Xaa Val Xaa Pro Asp

Phe Pro Lys Pro Gly Ile Leu Phe Gln Asp Ile Thr Thr Leu Leu Leu Asp Pro Gln

+ + + + +

Xaa Pro Lys Pro Gly Xaa Met Phe Gln Asp Ile Xaa Xaa Xaa Xaa Phe Asp Pro Lys

Ala Phe Arg Asp Thr Thr Asp Leu Phe Val Glu Arg Tyr Lys Asp Lys Asp Ile Thr

+ + + + +

Ala Xaa Arg Asp Asn Ile Tyr His Phe Val Lys Arg Tyr Lys Asp Gln Gly Ile Thr

Val * Val Ala Gly Val Glu Ala Arg Gly Phe Ile Phe Gly Pro Pro Ile Ala Leu

+ + + + +

Xaa g Lys Xaa Gly Val Lys Ala Arg Gly Xaa Xaa Phe Gly Thr Thr Xaa Ser Xaa

Ala Ile Gly Ala Lys --- Phe Val Pro Ile Arg Lys Pro Lys Lys Leu Pro Gly Glu

+ + + +

Xaa Xaa Leu Val Lys Asn Xaa Xaa Xaa Leu Arg Lys Xaa Asn Xaa Xaa Pro Xaa Xaa

Val Ile

+

Met Ile

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In view of this information, particularly the degree of amino acid sequence similarity between the wheat and Arabidopsis sequences known in the prior art, one of ordinary skill in the art would not have doubted that SEQ ID NO: 5 encoded part of a maize adenine phosphoribosyl transferase. However, it is clear that SEQ ID NO: 5 does not encode the complete sequence for the maize adenine phosphoribosyl transferase. The wheat sequence is 181 amino acids in length and the Arabidopsis sequence is 183 amino acids in length. In view of the nucleotide in SEQ ID NO: 5 that would result in a frame shift, SEQ ID NO: 5 can only be considered to encode approximately 59 amino acids of the maize adenine phosphoribosyl transferase. A nucleic acid sequence comprising SEQ ID NO: 5 or its complement would be useful as a probe to isolate the full length sequence. As such, the utility rejection under 35 USC 101 set forth in the prior Office action will be withdrawn.

In view of this information, one of ordinary skill in the art would recognize that soybean adenine phosphoribosyl transferase does not contain SEQ ID NO: 5.

Claims 1 and 18-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 is directed to a sequence that encodes a maize adenine phosphoribosyl transferase or a soybean adenine phosphoribosyl transferase. As written, the claim requires a sequence that encodes the entire enzyme. For the reasons set forth above, the specification does

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not disclose a complete soybean sequence that contains SEQ ID NO: 5. For the reasons, set forth above, the specification does not disclose a complete maize sequence that contains SEQ ID NO: 5. One of ordinary skill in the art would not be able to envision the nucleic acid molecules that would have these properties based on the disclosure in the specification and what was known in the prior art.

Claims 18-19 are directed to a first nucleic acid molecule that encodes a maize adenine phosphoribosyl transferase or a soybean adenine phosphoribosyl transferase and further this sequence is not required to contain SEQ ID NO: 5 but rather to hybridize to a second nucleic acid molecule which in some embodiments is SEQ ID NO: 5 or complement thereof. In addition, claims 18-19 contain limitations to hybridization and complements. The specification on page 37 defines "complement" as fully complementary. Furthermore, the specification defines "specifically hybridizing" on page 37 to be if the two molecules are capable of forming anti-parallel, double-stranded nucleic acid structure. As written, the claims require a sequence that encodes the entire enzyme. These claims are likewise not adequately described. One of ordinary skill in the art would not be able to envision the nucleic acid molecules that would have these properties based on the disclosure in the specification and what was known in the prior art.

As set forth in the prior Office actions, adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it.

Applicant's arguments on pages 13-14 of the response are not persuasive. While applicant points to parts of the specification that describes types of variations that may be found in sequences, the specification does not adequately describe the structure of approximately 2/3 of the nucleotide sequence encoding the maize protein. Of the portion that is provided, the

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sequence provided does not encode all of the completely conserved positions for this family or even the two members known at the time of the invention. (See Xing et al.) Nor does one of ordinary skill in the art know what portions of the sequence provide the structure that would make the structure identifiable as being from maize or soybean rather than another plant. For example, Figure 2 of Xing et al. shows that the rice (*O. sativa*) sequence is the only one that has valine at the position equivalent to amino acid 81 of the rice sequence. It is unknown what sequence characteristics are unique to the complete soybean or maize sequence. In particular, the added nucleotide that would cause a frame shift that is present in SEQ ID NO: 5 makes it entirely unclear what the C-terminus of the protein would look like (and thus the nucleic acid that would encode it). Note that if SEQ ID NO: 5 is translated as presented, none of the conserved positions shown in the alignment presented within this Office action following the marked position are found as a completely different C-terminus would be produced. The specification does not adequately describe the claimed nucleic acid molecules encoding the complete protein for either maize or soybean.

Claim Rejections - 35 USC § 102

Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Moffat et al. (1992).

Moffat et al. is applied as in the prior Office action.

The language of claim 12 is “comprises a nucleic acid sequence of SEQ ID NO: 5 or complement thereof” (underline added). This is construed to include a subsequence of SEQ ID NO: 5 with no limitation as to the length. Moffat et al. teaches a sequence that comprises a subsequence meeting these limitations as set forth in the prior Office action.

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Claims 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by the Sigma Catalog (1990).

This reference is applied as in the prior Office action.

The language of claim 12 is “comprises a nucleic acid sequence of SEQ ID NO: 5 or complement thereof” (underline added).

The language of claim 13 is “consists of a nucleic acid sequence of SEQ ID NO: 5 or complement thereof” (underline added).

The language of claim 14 is “identity with a nucleic acid sequence of SEQ ID NO: 5 or complement thereof” (underline added).

This is construed to include a subsequence of SEQ ID NO: 5 with no limitation as to the length. The Sigma Catalog teaches sequences that consist of a subsequence meeting these limitations as set forth in the prior Office action.

Conclusion

Claims 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne P. Allen whose telephone number is 571-272-0712.

The examiner can normally be reached on Monday-Thursday, 5:30 am - 1:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel can be reached on 571-272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Marianne P. Allen
Primary Examiner
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mpa